

## CLAIMS

What is claimed is:

1. A control for an HVAC system comprising:  
a central control for receiving a plurality of zone control signals providing information on a desired temperature and an actual temperature for each of a plurality of zones; and  
said central control utilizing a current one of said zone control signals and at least a prior one of said zone control signals to determine a desired staging demand for an associated HVAC system.
2. The control as set forth in claim 1, wherein said zone control signals are utilized to calculate a system demand, and said prior zone control signals are utilized from prior system demands, with said central control utilizing current and prior ones of said system demands to determine said desired staging demand.

3. The control as set forth in claim 2, wherein said staging demand is determined by the following formula:

Staging Demand =  $x(\text{System Demand}) + y(\text{the sum of a plurality of prior System Demands taken over time})$

wherein  $x$  and  $y$  are positive constants.

4. The control as set forth in claim 2, wherein said system demand is calculated by weighting the zone having the greatest absolute value of difference between its set point and its actual temperature .

5. The control as set forth in claim 4, wherein said system demand is calculated by the following formula:

System Demand =  $[(\text{the sum of demands from zones which have demand}) / (\text{the number of zones having demand}) + \{ \text{the greatest zone demand} \}] / 2$

wherein the  $\{ \}$  symbols indicate the demand of the zone having the greatest absolute value of demand.

6. The control as set forth in claim 1, wherein said prior zone control signals are taken over a plurality of time periods prior to a point at which said staging demand is determined.

7. The control as set forth in claim 6, wherein a first multiplier is multiplied by said current zone control signals, and a second multiplier is multiplied by a sum of said prior zone control signals taken over a period of time.

8. A method of operating an HVAC system comprising the steps of:

(1) providing a zone control in each of a plurality of zones, each said zone control allowing the setting of a zone set point, and each including a sensor for sensing an actual zone temperature, and sending signals to a central control indicative of the zone set point and the actual zone temperature;

(2) determining a zone demand for each zone in said central control based upon said zone set point, and said actual zone temperature; and

(3) determining a desired stage for an associated HVAC system, said determination being based upon a current value of said zone demand, and prior values of said zone demands.

9. The method as set forth in claim 8, wherein said zone demands are utilized to calculate a system demand based upon said plurality of zone demands.

10. An HVAC system comprising:

an HVAC component for changing the temperature of air in an environment;

ducting to provide air to a plurality of distinct zones from said HVAC component;

a plurality of zone controls each allowing the setting of a zone set point, and each determining an actual zone temperature, said zone controls sending signals to a central control; and

said central control utilizing current ones of said zone control signals, and at least a prior one of said zone control signals to determine a desired staging demand for said HVAC component.

11. The system as set forth in claim 10, wherein said zone control signals are utilized to calculate a system demand, and said prior zone control signals are utilized from prior system demands, with said central control utilizing current and prior ones of said system demands to determine said desired staging demand.

12. The system as set forth in claim 11, wherein said staging demand is determined by the following formula:

Staging Demand =  $x(\text{System Demand}) + y(\text{the sum of a plurality of prior System Demands taken over time})$

wherein  $x$  and  $y$  are positive constants.

13. The system as set forth in claim 11, wherein said system demand is calculated by weighting the zone having the greatest absolute value of difference between its set point and its actual temperature.

14. The system as set forth in claim 13, wherein said system demand is calculated by the following formula:

System Demand = [(the sum of demands from zones which have demand) / (the number of zones having demand) + {the greatest zone demand}] / 2

wherein the { } symbols indicate the demand of the zone having the greatest absolute value of demand.

15. The system as set forth in claim 10, wherein said prior system zone control signals are taken over a plurality of time periods prior to a point at which said staging demand is determined.

16. The system as set forth in claim 15, wherein a first multiplier is multiplied by said current ones of said zone control signals, and a second multiplier is multiplied by a sum of said prior zone control signals taken over a period of time.

17. The system as set forth in claim 16, wherein said zone control signals from each of said plurality of zones are taken together to determine a system demand, and said system demands are utilized by said central control as said current and prior zone control signals.